very well, and as the solutions seem to keep well, and are easily made, it may be worth mentioning.

Separate solutions were made of nitrate of silver and caustic potash in the proportion of 1 oz. of each to 10 oz. of water. For the reducing agent glucose was used, and a solution of one half oz. in 10 ozs. of water was made. These three solutions, or any quantity in the same proportion, with liq. ammoniæ and distilled water being ready, the proper quantity was determined on upon the basis that the above quantities would be sufficient for 250 square inches of surface, and used in the following way:—

Ammonia was added to the solution of silver till the turbid appearance first produced had quite cleared; the potash solution was then added, and ammonia again added till the mixture was clear. Then a weak solution of silver was added, drop by drop, till the appearance was decidedly turbid again. The mirror which, before beginning, had been lowered into the dish already containing the proper amount of distilled water, was now lifted up, and the above mixture, together with the glucose solution, poured in and stirred well, and the mirror carefully lowered. At a temperature of about 56° a fine film was got in 43 minutes on the three-foot mirror. I have used some of the same solutions at various times to silver small surfaces, and find I can get a good film in much less time, particularly if the temperature is a little higher. No doubt for higher temperatures some modifications would have to be made, but the use of glucose allows a more certain determination of the proportions proper for certain temperatures than any mixture of sugar and acid, the active properties of which as a reducing agent are uncertain and changeable.

Ealing:
1881, *December* 8.

On a new Form of Transit-Circle with a Prismatic Object-Glass.

By E. J. Stone, M.A., F.R.S.

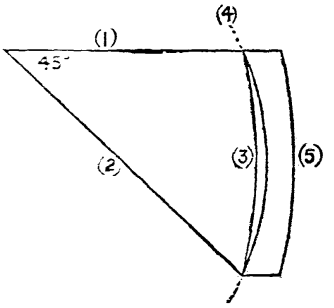
The proposed form is adapted either for Transit-Circle or Altazimuth, and it appears to me to offer many advantages. I am quite sensible of the difficulties of securing good prisms, but I think they are not insuperable. I have been in communication with Mr. Grubb on the subject, and I hope to give an object-glass of this description a fair trial as soon as Mr. Grubb is sufficiently relieved from the pressure of work in connection with the equipments of the Transit of *Venus* expeditions to undertake the manufacture of the object-glass.

I take for the calculations the following indices of refraction; but others can easily be adopted, if known, for the glass to be used:—

	Crown Glass.	Flint Glass.
D	1·52959	1·63504
E	1·53301	1·64202
F	1·53605	1·64826

The focal length of the combination is about 100 inches (99·972 inches) The following are the radii of curvatures, crown glass in front :—

Surface (1) sensibly plane
(2) ,,
(3) 21·928 inches
(4) 21·418 ,,
(5) 40·967 ,,

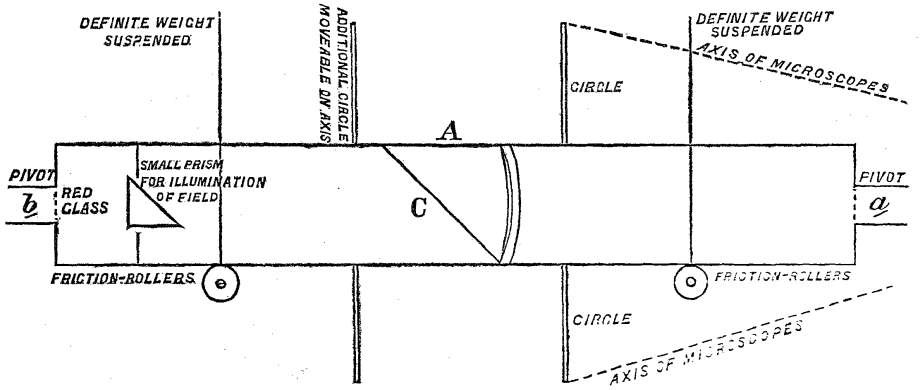


The spherical aberration is sensibly destroyed for light of the refrangibility of E.

The focal lengths are

D	99·973	99·972
E	99·968	
F	99·972	
C	100·028	

It is therefore an an achromatic object-glass for D, E, F. C stands out; but it occurs to me that if the wires were illuminated by red light through the opposite face of the prism, there would



be better definition and practically no loss of light. The only light really lost by the illumination of the wires would be that outstanding about C.

The surfaces A and C should be sensibly plane, but, as they turn with the whole optical sytem, exact geometrical planes are not necessary for accuracy.

The eyepiece joins on at *a*, and can be partially supported by friction-rollers with a definite weight suspended to avoid flexure. The whole turns about the pivots *a* and *b*, and should be reversible. The adjustments can all be determined as for an ordinary Transit-Circle, but reflexions near the zenith would be possible.

Radiant Points of Shooting Stars observed at Bristol in the Years 1878 *and* 1879. By W. F. Denning, Esq.

In continuation of my previous catalogues of meteor showers (*Monthly Notices*, Jan. 1877 and March 1878), I send two further lists, of 20 Radiants observed between July 21 and Aug. 10, 1878, and of 47 observed between July 28 and Nov. 14, 1879. I have selected the positions of such showers as were best observed, for in observations of this character there are always a large proportion of suspected streams from which four or five meteors only have been recorded. These have been omitted in the present case—indeed, it is necessary that uncertain positions should be invariably excluded, because they only originate complications which it is most desirable to avoid.

Towards the end of July and early in August 1878 we had a succession of very clear nights, and I recorded 621 shooting stars in 34 hours of observation. Amongst the large number of radiant points resulting from their reduction, two were of very exceptional character, and have already been referred to in the *Monthly Notices* (Jan. 1880, pp. 124-127). The following list comprises the most important streams :—